

### Problem # 156

What is the largest possible distance between two points, one on the sphere of radius 19 with center  $(-2, -10, 5)$  and the other on the sphere of radius 87 with center  $(12, 8, -16)$ ?

**Solution:**

*Answer:* 137

*Proof.*

The distance between the two centers of the spheres is equal to

$$\sqrt{(12 - (-2))^2 + (8 - (-10))^2 + (-16 - 5)^2} = \sqrt{14^2 + 18^2 + 21^2} = 31 .$$

Thus the largest possible distance is the sum of the two radii and the distance between the two centers, that is  $19 + 87 + 31 = 137$ .

□

Source: American Invitational Mathematics Examination (AIME) 1987.